CUTEC NEWS

Happy new year

FACTS · INFORMATION · ANALYSES

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Here's to the New Year ...

"There's a lot to lose
You can only win
Enough is too little
– or things will stay as they were
Stillstand is death – lead the way,
Everything stays different"

(Herbert Grönemeyer,
"Everything stays different")

Some things leave me speechless – speechless with astonishment; however, sometimes - though unfortunately less often – speechless with admiration and respect. Are you familiar with the advertisement for Germany as an economic territory? The central statement: "Don't keep complaining Germany – act instead!" contains a deep truth. When everyone is saying "We are in a bad way", this is neither an excuse nor justification for sinking into lethargy. Passivity is poison for a business enterprise – at any time – and also at the end of a year.

However, the new year is a good time to bring to life past and future achievements. What then have we accomplished? The financial situation has significantly improved through increased use of third-party funds. This improvement has been possible only through clear focussing on research. Research should not remain purely as an end in itself, however. A further important potential is the customers of CUTEC – our customers. We have been able to vitalise these relationships, not least through a little bit more customer friendliness. A lot has been achieved, however, as quoted in the text fragment above – standstill has something akin to an exodus.

On looking back, however, I am certain that CUTEC is well equipped for the future. Unmoved by the headlines in the media, which broadcast one economic crisis after another, we will continue to follow our own path together with our customers. At the same time, in future we will pay even more attention to binding customer relationships – but also to customer satisfaction. Reinforcement of quality assurance measures and the establishment of very much more efficient organisational structures will help us here to achieve these targets. Every business enterprise depends on expansion. By offering even more innovative services than before we will attract new customers.

Have you made any good resolutions for the new year ? Well, of course, good resolutions have the bad habit of being discarded at the next best opportunity. We should therefore concentrate only on the most important tasks. CUTEC is our task, so don't just talk – let us tackle the job together – properly and with conviction. I am firmly convinced that continual innovation creates lasting economic strength. Complaining then becomes superfluous.

I wish you and your families a successful year in 2003.

Yours sincerely Otto Carlowitz

IN THIS EDITION

Active environmental protection for Nigeria

The heart of Africa has not only numerous traditions and huge raw material reserves, but also has to struggle with serious environmental problems. One thinks immediately of the urban infrastructure in the large cities, particularly with regard to drinking water supplies and disposal of waste and waste water. However, the ecological situation in the coastal regions and in the oil producing regions requires answers, too. The resulting overall social and economical problems are restricting further development of the country.

The Nigerian government has asked CUTEC for help in preparing and implementing solutions to these problems. Discussions, at which the vice-president and the vice-secretary of state were present, as well as others, resulted in a decision on the following initial steps: The ecological situation in the regions with high oil production must be analysed and defined. Further objectives of this cooperation are the construction of a pilot plant for the utilization of domestic waste, and the implementation of structures for training and advanced training in "environmental technology"

The starting signal for concrete measures is expected in the near future. (les)

Water pollution abatement working group:

From waste water to water – with and without sludge

Investigation of water treatment from a process engineering point of view is a research area which has grown continuously in CUTEC since it was established. Currently the water pollution abatement working group includes six scientists, one foreign scholarship holder, two technicians, one laboratory assistant and approx. 10 students working as scientific assistants or as part of their studies and for their dissertations.

The profile of this working group has changed considerably in recent years. In the past the main emphasis has been on waste water treatment with new combinations of physical, chemical and biological processes. Since then production-integrated water treatment with the replacement of fresh water, sludge dewatering and biogas production have been added. In the course of the next few years new fields, including closed water circulation systems in textile cleansing and in the food industry, total degradation of organic sludges and development and optimisation of products will also be added. Particularly with regard to process water treatment incorporating water circulation systems, the main emphasis here will shift more towards disinfection of the water.

A further permanent part of activities is the organisation and carrying out of the international conference "Oxidation Technologies for Water and Waste Water Treatment", which was held in 1993 and 1995 as a national event and since 1996 has been held as an international event jointly with the Institute for Thermal Process Engineering of the Technological University in Clausthal. The next conference will take place in May 2003.

In contrast to most other working groups the activities of the water pollution abatement group are characterised by investigations carried out in external locations. The composition of sludges, waste water and industrial water is continually changing so that reliable data can only be determined from local tests. At the present time therefore five container pilot plants or technical test plants are being externally operated as research projects. These include terpene production in Uelzen, sludge conditioning at the Scharzfeld sewage plant, drainage water treatment at the Hattorf district waste disposal site, sewage sludge disintegration at the Scharzfeld sewage plant and nitrogen elimination with biocatalysts at the Innerstetal sewage plant in Bredelem. (siev)

3rd International Waste Water Conference in May 2003

Response to the "Call for Papers" has been excellent. The organisers of CUTEC and the Clausthal Technological University are very pleased with the number and the high technical quality of the contributions which have been submitted. Scientists from over 30 countries will be taking part at this conference. The programme has been fixed by members of the International Scientific Committee.

Technical questions will be explained in more detail with the aid of poster presentations, and well known exhibitors in the field of waste water technology will present their plants. A second announcement will be published shortly and can be retrieved under:
www.cutec.de/aop3/programme.html (kra)

BioRegioN "Environment" 2003 at CUTEC

The environmental biotechnology study group of the BioRegioN, in which CUTEC is represented by Dr. Sievers, is giving a series of lectures on "Applied Environmental Biotechnology in Lower Saxony".

A one day event concerning "Biotechnology in Waste Management" will be held on 25th February 2003 at CUTEC. The main subjects will include, for example, the new biomass regulation, MBA concepts following the 30th BImSchV regulation and biogas production from waste materials. Participation is free of charge. (

Varied and attractive:

CUTEC offers visitors a wide range of topics

The conference of the Association of German Engineers (Verein Deutscher Ingenieure – VDI) on the subject "Substitute Fuels in Large Incinerators" offered plenty of opportunity for discussion. The conclusion: waste incineration is a particularly challenging problem for waste processing technology.

During the "Information Days for Schools" in the CUTEC building a large number of grammar school pupils learned how students and young scientists carry out intensive work on environmental developments and at the same time work towards further qualifications under practical conditions. Particularly interesting were the pilot plant tests on an incineration plant in which the formation and decomposition of nitrogen oxides during incineration of domestic waste was examined.

With the VDI during the discussion on secondary fuels

Representatives of the Ministry of the Environment (MU) for Lower Saxony, CUTEC and the TUC came together once more for an exchange of ideas. It was decided that the online floc sensor used in sludge dewatering should be tested in other applications, with support from the MU.

CUTEC was host at the half-yearly conference of the study group of technology transfer centres of universities in Lower Saxony, together with the Ministry for Science and Culture. There was an exchange of experience during the conference and CUTEC presented itself as a modern business enterprise, deeply rooted in the commercial field, which for years has been successfully involved in technology transfer. In several meetings of committees of experts organised on a nationwide basis experts from CUTEC have been concerned with technical and political problems on thermal waste treatment.

Professor Riebel, BTU Cottbus, has taken over continuation of the long standing "Clausthal Course on Particle Measurement Techniques" from the former CUTEC managing director, Professor Leschonski, who died in March 2002. At the exhibition of apparatus, which accompanied the course and was held at the CUTEC Institute, leading manufacturers from home and abroad presented their range of products. (kra)

Flue gas purification for small fire test furnaces

CUTEC develops purification technology for material testing

The firm svt BRANDSCHUTZ operates a small fire test furnace (see photo) in Seevetal, which is used for research and further development of products for fire protection of buildings. During a fire test cable material or tubes of, for example, PVC are burnt under standard conditions. During this process a strongly smoking waste gas with an intensive smell is produced. A plant technology is to be developed which reduces soot and hydrogen chloride, as well as other components. This project is being promoted by the German Federal Environment Foundation (Deutsche Bundesstiftung Umwelt – DBU).

The waste gas from the test furnace is first passed into a reheating chamber, where a large proportion of the pollutants are already converted at a temperature of 1100 °C. In the following soot filtration step deposition of the remaining soot particles takes place, and these are also burnt off at 1100 °C. The waste gas is then cooled to 170 °C by a heat transfer unit and finally by water quenching. In a granular bed filter containing a granulate consisting of a mixture of hearth furnace coke and white lime hydrate, separation of the highly corrosive hydrogen chloride takes place. The final purification step is carried out in a fabric filter (police filter) before the waste gas is passed through a chimney into the atmosphere by means of a fan in the last step of the process.

The project is to be completed in several partial steps. In August 2002 a measurement was made for taking stock of the actual situation and determination of the main planning parameters. Detailed planning is now taking place jointly by both project partners. Following preassembly in Clausthal-Zellerfeld, installation on the small fire test furnace in Seevetal is planned. In preliminary trials here both the influencing parameters for optimisation of the operating conditions for the reheating chamber and the technical equipment parameters will be investigated. Selection of the optimum filter system for soot separation is one of the main objectives of the project. Ceramic ball packing is first to be examined. From the results of these preliminary trials modifications and corrections to the plant components can be carried out. Following this the other purification components – waste gas cooling, adsorption and filtration will be installed. Complete commissioning of the flue gas purification plant with functional testing will be accompanied by emission measurements carried out by CUTEC.

According to svt BRANDSCHUTZ only about 20% of the approx. 200 – 250 test furnaces in Germany are equipped with waste gas purification. Following harmonisation of the European fire protection standards an increased number of fire tests can be expected. Fitting of new test furnaces with this purification technology, or retrofitting of existing plants, will guarantee reliable elimination of the above mentioned components from these polluting waste gases. From the ecological aspect this will make a meaningful contribution to the prevention of air pollution. (dam)

Small fire test furnace from the firm svt Brandschutz in Seevetal

Forecast of pollution of ground water with drainage water

The idea of this project came into being jointly through the partners Professor Gock and Professor Schwedt / Clausthal Technological University, together with the European Engineer Association Lhotzky + Partner / Brunswick. The BMBF commissioned CUTEC to develop a test method for the determination of swelling (pregelatinized) starch as a measure of the mobilisation of pollutants in soils and deposits. Dr Zeller is the project leader of this association, which includes the appointment of three project-financed project workers. Weathering conditions were simulated by using water enriched with oxygen and carbon dioxide on a laboratory and pilot plant scale, with the object of creating an environment as near as possible to reality. In this way the test material could be examined under almost natural conditions. The necessary shortening of the weathering period was first achieved by using defined pressure and temperature conditions in autoclaves. The course of the test was sequential, corresponding to natural weathering phases. With this method it was possible to qualify and balance the reaction kinetics. Parallel to this a volume of 5 m^3 was used to confirm this innovative test method. For validation purposes comparative tests were carried out using conventional standard elution methods. (ze)

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Clausthal Mountain and University celebrations

Motto: "Four Elements and the Environment" presented at local level

This year the Technological University again invited everyone to the Clausthal Mountain and University Celebrations and huge numbers were only too pleased to accept the invitation. Apart from the Freiberg mountain parade, voluntary fire brigades of the region, the technical relief organisation and many institutes of the Technological University, this year CUTEC also took part. Under the motto: "Four elements, intimately united, forming life, building the world" we presented ourselves both in the big parade and at the following celebrations in the quadrangle.

Four elements – intimately united – decorate the big parade

Here at the latest was a possibility for presenting the tasks and objectives of CUTEC in detail in direct dialogue with the public. Apart from environmental aspects, our role as employer here in the region was often a subject for discussion. Admittedly we achieved the greatest popularity with old and young with our helium-filled balloons. However, isn't it true that the children of today are our customers of tomorrow? (kl)

Report of the works committee

One of the main points with regard to jobs is cooperation in work on drafting of the administration handbook. A key point here is the regulation of working hours. Demands on an innovative research institute can be fulfilled only to a limited extent with fixed working hours in the operative field. Thus in the past it has often been necessary to carry out test and measurement campaigns which, for example, necessitated night work and several days working in companies away from home, and this will also be required in future. The basic readiness of staff in this respect should be acknowledged within the framework of a working hours regulation, with suitable compensation. Furthermore job contract regulations could be drawn up for colleagues who are available at times for research projects of the Technological University under CUTEC participation. (ze)

Chairman of the scientific advisory committee: Professor Dr.-Ing. Hans-Peter Beck in profile

Prof. Dr.-Ing. Hans-Peter Beck

Professor Beck has always remained faithful to Lower Saxony. Born near Wolfsburg in 1947, he studied electrical engineering, and as a qualified heavy current electrician his career lead him to the Technological University in Berlin via the University for Applied Science at Brunswick-Wolfenbüttel. He did a doctorate in 1981 and then took over senior responsibilities at the AEG in the field of railway technology.

In 1990 he was appointed university professor and director of the Institute for Electrical Power Engineering at Clausthal. As dean of the faculty, deputy vice-chancellor and the present vice-president of Clausthal Technological University, he has given significant impulses to the field of research and university development. The main subjects of his scientific activities are decentral power systems, electrical drives and the utilization of wind energy. His professional competence is demonstrated by over 60 publications, 30 patents, numerous memberships in committees of experts, his activities as an expert, as well as his engagement for the German Research Association.

Professor Beck will be chairman of the CUTEC advisory committee until 2005. His concern is to intensify "cooperation between the institutions TUV and CUTEC, which complement one another conceptionally very well, and to let them profit from one another. The advisory committee will play its part in finding research lines with a promising future. The points have been switched. We must now ensure that the "trains" travel in the right direction at the right speed, so that they reach their destination. I am looking forward to our mutual journey." (kra)

Congratulations

Our belated congratulations to the manager of our mechanical workshop, Mr Henry Nettelmann, on his 60th birthday. We wish him all the best, good health and success.

DATES:

- Committee of experts – "High temperature technology" of the VDI Process Engineering and Chemical Engineering Association (GVC) on 20th and 21.2.03
- "Information Days for Schools" with Clausthal Technological University on 26th and 27.3.03
- CUTEC presentation at the ACHEMA 2003 from 19th to 24.5.03 in Frankfurt

Scientific new generation

Torsten Reindorf and Sebastian Rubin new in the team

Torsten Reindorf, a graduate of the University for Applied Science in Trier in the special field of supply technology, has been working in the department of model construction and simulation since 1.9.02. Following his dissertation (1st prize of the Bälz Foundation) he completed the supplementary course on power systems technology at Clausthal Technological University.

As from 1.1.2003 Sebastian Rubin will be working in the chemical processes department in cooperation with the IUW on the development of reformers. Following his training as a chemical-technical assistant he studied supply technology at the University of Applied Science in Brunswick-Wolfenbüttel. He completed his dissertation in 2001 at VW on the subject of hydrogen production. He will shortly be completing his supplementary studies in chemical engineering at the TUC. (kra)

New challenges for Dipl.-Ing. T. Reindorf and Dipl.-Ing. S. Rubin (re.)